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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09/876,661	06/07/2001	Thomas M. Marshall	US 010287	9584

7590 08/23/2002

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EXAMINER	
ARTMAN, THOMAS R	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/876,661	MARSHALL ET AL.	
	Examiner	Art Unit	
	Thomas R Artman	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laskowski (USPN 5,923,413) in view of Voser (USPN 6,172,745).

With respect to claim 1, Laskowski's scan head for a bank note validator is an LED luminaire with most of the claimed structure, including 1.) an array of LEDs (Fig.2, item 32) with at least one LED for each of a plurality of colors, 2.) a partially reflecting element (item 30) that reflects some of the LED output light back towards the array, and 3.) a light sensor array (item 34) to intercept and measure a portion of the reflected light. Laskowski does not disclose a condenser lens to direct light into a light guide. Voser's apparatus includes an LED luminaire with LED arrays (Fig.1, items 8 and 16), where the light from the LED arrays is directed toward a light guide (item 16) to channel the light in a useful way. However, Voser does not disclose or teach of the use of condenser lenses for directing the LED arrays' output into the light guide. It would be appreciated by one skilled in the art that condenser lenses are quite common, particularly in the optical communication industry, or in any situation where light needs to be concentrated onto a small area, such as the end of a fiber optic cable. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to 1.) use a

light guide in order to channel light from the LED arrays in a useful way, and 2.) use a condenser lens to improve the coupling of the LED array output light to the light guide.

With regards to claim 2, the structure of Laskowski and Voser as applied above against claim 1 applies here and the following. Laskowski and Voser disclose that the light output from each color in their arrays are to be pulsed sequentially such that the light sensors would detect the reflected light from each color individually. Laskowski does not specifically mention an electrical current source for the LED arrays. It would be obvious to one skilled in the art that a current source would be needed in order to actuate an LED, which then, by definition, would have a "light output", and since multiple LEDs are actuated at once, there would be a "combined light output." It would also be appreciated by one skilled in the art that many intended uses of LED sources or any light source require calibration. In fact, Voser describes a structure and method for calibration, in col.6, lines 1-34, including a current source, the means to compare the output light to a reference level, and the control means to adjust the light output via the current source to match the LED array output to the reference level. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a current source to actuate the LED arrays and have the calibration means to achieve the desired light output.

In regards to claim 8, Laskowski's scan head for a bank note validator is an LED luminaire with most of the claimed structure, including 1.) an array of LEDs (Fig.2, item 32) with at least one LED for each of a plurality of colors, and 2.) an array of light sensors (item 34) that are associated with each group of LEDs and are positioned to intercept and measure at least a portion of the light output of its associated group of LEDs. Laskowski does not disclose a light

guide. Voser's apparatus includes an LED luminaire with LED arrays (Fig.1, items 8 and 16), where the light from the LED arrays is directed toward a light guide (item 16) to channel the light in a useful way. However, Voser does not disclose or teach of the use of condenser lenses for directing the LED arrays' output into the light guide. As argued against claim 1, it would be appreciated by one skilled in the art that condenser lenses are quite common, particularly in the optical communication industry, or in any situation where light needs to be concentrated onto a small area, such as the end of a fiber optic cable. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to 1.) use a light guide in order to channel light from the LED arrays in a useful way, and 2.) use a condenser lens to improve the coupling of the LED array output light to the light guide.

With respect to claim 10, the structure of Laskowski and Voser as applied above against claim 8 applies here and the following. Laskowski does not specifically mention an electrical current source for the LED arrays. As argued against claim 2 above, it would be obvious to one skilled in the art that a current source would be needed in order to actuate an LED, which then, by definition, would have a "light output", and since multiple LEDs are actuated at once, there would be a "combined light output." It would also be appreciated by one skilled in the art that many intended uses of LED sources or any light source require calibration. In fact, Voser describes a structure and method for calibration, in col.6, lines 1-34, including a current source, the means to compare the output light to a reference level, and the control means to adjust the light output via the current source to match the LED array output to the reference level. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to have a current source to actuate the LED arrays and have the calibration means to achieve the desired light output.

Claims 3-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laskowski and Voser, and in further view of Gau (USPN 5,739,915).

With respect to claim 3, the structure of Laskowski and Voser as applied above against claims 1 and 2 above applies here and the following. As stated above against claim 2, both Laskowski and Voser specifically describe the process of producing illumination of each color in sequential pulses. Also, Gau teaches in col.1, lines 24-67, that a conventional electro-optic device using red, green and blue source wavelengths has an array of photodetectors that detects the reflected signals from each wavelength since the sources are sequentially switched on and off. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to alternate pulses of red, green and blue light in order to detect each wavelength with one detector in an electro-optic device, such as the claimed LED luminaire.

In regards to claim 4, the structure of Laskowski and Voser as applied above against claims 1 and 2 above applies here and the following. Laskowski and Voser do not use separate arrays of detectors with filters to perform the function of sampling the reflected wavelengths of interest. However, in col.2, lines 6-47, Gau describes another conventional electro-optic device that improves the scanning time by having three arrays of detectors. Each detector array has a filter, one for passing only red light, one for green and one for blue. In this way, the same function of detecting red, green and blue reflected light is achieved as using individual sources and one detector array, and the process is improved by one third (lines 7-8) since the detection of each occurs simultaneously. Therefore, it would have been obvious to one of ordinary skill in

the art at the time the invention was made that either the use of three sources illuminated in sequential pulses (as in claim 3 above) or the use of continual illumination with three detector arrays with filters are structural equivalent substitutions, with the latter being an improvement in economy.

With respect to claim 5, the structure of Laskowski, Voser and Gau as applied against claims 1,2 and 4 above applies here and the following. All three references describe the common use of photodiodes as photodetectors, and therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made.

In regards to claim 6, the structure of Laskowski, Voser and Gau as applied against claims 1,2 and 4-5 above applies here and the following. As described above against claim 4, Gau teaches that it is known in the art to use separate detectors with filters to detect individual wavelengths of light simultaneously, and, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made.

With respect to claim 7, the structure of Laskowski, Voser and Gau as applied against claims 1,2 and 4-5 above applies here and the following. Voser has the structure, as broadly as claimed, including a light diffuser (Fig.1, item 16) and a light integrator (item 20). The light guide plates act as a diffuser that blends the output of the individual LEDs in the arrays in order to illuminate the entire width of the bank note evenly (col.5, lines 19-21). The light integrators are lenses that focus the reflected light from the bank note onto discrete photodiodes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to 1.) use a light diffuser for broad coverage by the LED luminaire, and 2.) to use a light integrator to focus at least a portion of the light onto a sensor for detection and calibration.

With regards to claim 9, the structure of Laskowski and Voser as applied against claim 8 above applies here and the following. Laskowski's groups of LEDs have four, not three LEDs, and Voser's groups have seven LEDs. The reasons for these groupings are related to the number of wavelengths needed for the application. For example, Laskowski has four LEDs per group in his arrays: IR, red, green and blue for bank note validation. Voser requires six wavelengths, four in the IR spectrum and two in the visible. The reason for seven is that the output of the green LED is not nearly as efficient (about ½) as the other LEDs, so and extra green LED per grouping is added for a balanced illumination. Gau describes a group of three LEDs, red, green and blue, for scanning color documents. This application operates in the visible spectrum, and it can be appreciated by one skilled in the art that individual red, green and blue illumination devices are often used for projecting all the colors of the visible spectrum, such as the phosphorescent pixels of a TV screen that are grouped in threes of red, green and blue. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to group red, green and blue light sources together for emitting any desired color in the visible spectrum.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 4:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

July 29, 2002

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER